

Appl. No. 09/899,242
Amdt. Dated November 4, 2004
Reply to Office action of August 12, 2004
Attorney Docket No. P14168-US2
EUS/J/P/04-2157

Amendments to the Claims:

This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for allocating radio resources in a radio communication system comprising the steps of:
 - selecting a service quality requirement for a first service group and a second service group;
 - determining an amount of radio resources for the first and second service groups to achieve the respective service quality requirement; and
 - allocating the radio resources between the first and second service groups based on a difference between the determined amount of radio resources, wherein the radio resources are allocated per bearer within the first and second service groups;
 - wherein the amount of radio resources is based on a power level used for the first and second service groups and the difference between the determined amount of radio resources is a difference in power between the first and second service groups; and
 - wherein the amount of radio resource is further based on the scheduling to the first and second service group such that the amount of channel used by each service group is controlled by the scheduling.
2. (Original) The method of claim 1, wherein the determined amount of radio resources is a relative amount of radio resources between the first and second service groups.
3. (Original) The method of claim 1, wherein the determined amount of radio resources is an absolute amount of radio resources for the first and second service groups.

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4. (Original) The method of claim 1, wherein said service quality is a function of user quality, within the service group.

5. (Original) The method of claim 4, further comprising the step of:
compensating the amount of radio resources for the first and second service groups based upon a percentage of users of the first and second service groups which is desired to achieve the quality of service requirement,

wherein the radio resources are allocated based upon the compensated amount of radio resource.

6. (Original) The method of claim 4, wherein the quality of service requirements is measured or estimated by carrier-to-interference ratios, bit error probability, bit error rate, frame erasure rate or block error rate.

7. (Original) The method of claim 5, wherein the compensation is based on the carrier-to-interference ratio standard deviation.

8. (Cancelled)

9. (Currently Amended) The method of claim [[8]] 1, wherein the difference in power between the first and second service groups is applied to a fixed output power of the first service group.

10. (Currently Amended) The method of claim [[8]] 1, wherein the difference in power between the first and second service groups is applied to a maximum power for the first service group.

11. (Currently Amended) The method of claim [[8]] 1, wherein the difference in power between the first and second service groups is applied to an initial power for the first service group.

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12. (Currently Amended) The method of claim [[8]] 1, wherein the difference in power between the first and second service groups is applied to a fixed power, a maximum power and an initial power for the first service group.

13. (Currently Amended) The method of claim [[8]] 1, further comprising the step of:

adjusting the power for individual users of a service group using individual power control loops.

14. (Currently Amended) The method of claim [[8]] 1, wherein the amount of radio resource is further based on the number of channels allocated to the first and second service group.

15. (Cancelled)

16. (Currently Amended) The method of claim [[8]] 1, wherein the step of allocating the radio resources further comprises the steps of:

calculating a sum of the total power for all users in the radio communication system; and

admitting new users to the radio communication system if the sum is less than a predetermined threshold.

17. (Original) The method of claim 16, further comprising the step of:
dropping users from the radio communication system if the sum is greater than another predetermined threshold, wherein the radio communication system includes at least two base stations.

18. (Currently Amended) The method of claim [[8]] 1, wherein the step of allocating the radio resources further comprises the steps of:

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calculating a function of the power for all users in the radio communication system; and

admitting new users to the radio communication system if the calculated function is less than a predetermined threshold.

19. (Original) The method of claim 18, further comprising the step of:
dropping users from the radio communication system if the calculated function is greater than another predetermined threshold, wherein the radio communication system includes at least two base stations.

20. (Currently Amended) The method of claim ~~[[8]]~~ 1, wherein the step of allocating the radio resources further comprises the steps of:

calculating a weighted sum of the power for all users in the radio communication system; and

admitting new users to the radio communication system if the weighted sum is less than a predetermined threshold.

21. (Original) The method of claim 20, further comprising the step of:
dropping users from the radio communication system if the weighted sum is greater than another predetermined threshold, wherein the radio communication system includes at least two base stations.

22. (Currently Amended) The method of claim ~~[[8]]~~ 1, wherein the radio communication system includes a base station, the step of allocating radio resources further comprises the steps of:

calculating a sum of the total power for all users communicating with the base station;

admitting new users to the base station if the sum is less than a predetermined threshold; and

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dropping users from the base station if the sum is greater than the predetermined threshold.

23. (Original) The method of claim 16, wherein the radiocommunication system is a GSM/EDGE radio access network (GERAN).

24. (Original) The method of claim 1, wherein the selecting step and the determining step are continuously performed to provide an updated allocation of radio resources.

25. (Original) The method of claim 5, wherein the percentage of users of the first and second service groups who can achieve the quality of service requirement is measured and the amount of radio resources is adaptively compensated for based upon the updated percentage of users of the first and second service groups.

26. (Original) The method of claim 1, wherein the selecting, determining and allocating steps are performed for the first service group, the second service group and a third service group.

27-29. (Cancelled)

30. (Currently Amended) A method of allocating radio resources for a first and second service group comprising the steps of:

determining an amount of radio resources at which the first service group can provide an minimum quality of service level;

determining an amount of radio resources allocated for the second service group;
and

reallocating radio resources proportionally from the second service group to the first service group such that the service quality limits are simultaneously met;

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determining an amount of radio resources at which a third service group can provide an minimum quality of service level;
determining an amount of radio resources allocated for a third service group; and
reallocating radio resources from the fourth service group to the third service group such that the total load between the first, second, third and fourth service groups is maximized.

31. (Original) The method of claim 30, wherein the radio resources are reallocated to maximize capacity.

32. (Cancelled)

33. (Original) The method of claim 30, wherein the radio resources are an output power for the first and second service groups.

34. (Original) The method of claim 33, wherein the radio resources are further a channel allocation for the first and second service groups.

35. (Original) The method of claim 33, wherein the output power for the first and second service groups is a per bearer output power for the first and second service groups.

36. (Original) The method of claim 33, wherein the output power is an initial power for the service group.

37. (Original) The method of claim 33, wherein the output power is a maximum power for the service group.

38. (Original) The method of claim 33, wherein the output power is a fixed power for the service group.

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39-46. (Cancelled)

47. (Currently Amended) A radio communication system comprising:
means for selecting a service quality requirement for a first service group and a second service group, wherein said service quality is a function of user quality, within a service group;

means for determining an amount of radio resources for the first and second service groups to achieve the respective service quality requirement; and

means for allocating the radio resources between the first and second service groups based on a difference between the determined amount of radio resources, wherein the radio resources are allocated per bearer within the first and second service groups;

means for compensating the amount of radio resources for the first and second service groups based upon a percentage of users of the first and second service groups which is desired to achieve the quality of service requirement;

wherein the radio resources are allocated based upon the compensated amount of radio resource; and,

wherein the percentage of users of the first and second service groups who can achieve the quality of service requirement is measured and the amount of radio resources is adaptively compensated for based upon the updated percentage of users of the first and second service groups.

48. (Original) The system of claim 47, wherein the determined amount of radio resources is a relative amount of radio resources between the first and second service groups.

49. (Original) The system of claim 47, wherein the determined amount of radio resources is an absolute amount of radio resources for the first and second service groups.

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50-51. (Cancelled)

52. (Currently Amended) The system of claim 47 ~~[[50]]~~, wherein the quality of service requirements is measured or estimated by carrier-to-interference ratios, bit error probability, bit error rate, frame erasure rate or block error rate.

53. (Currently Amended) The system of claim 47 ~~[[51]]~~, wherein the compensation is based on the carrier-to-interference ratio standard deviation.

54. (Currently Amended) The system of claim 47 ~~[[50]]~~, wherein the amount of radio resources is based on a power level used for the first and second service groups and the difference between the determined amount of radio resources is a difference in power between the first and second service groups.

55. (Original) The system of claim 54, wherein the difference in power between the first and second service groups is applied to a fixed output power of the first service group.

56. (Original) The system of claim 54, wherein the difference in power between the first and second service groups is applied to a maximum power for the first service group.

57. (Original) The system of claim 54, wherein the difference in power between the first and second service groups is applied to an initial power for the first service group.

58. (Original) The system of claim 54, wherein the difference in power between the first and second service groups is applied to a fixed power, a maximum power and an initial power for the first service group.

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59. (Original) The system of claim 54, further comprising:
means for adjusting the power for individual users of a service group using individual power control loops.

60. (Original) The system of claim 54, wherein the amount of radio resource is further based on the number of channels allocated to the first and second service group.

61. (Original) The system of claim 54, wherein the amount of radio resource is further based on the scheduling to the first and second service group such that the amount of channel used by each service group is controlled by the scheduling.

62. (Currently Amended) The system of claim 47 ~~[[50]]~~, wherein the system provides an updated allocation of radio resources using the means for selecting and means for determining.

63. (Cancelled)

64. (Currently Amended) The system of claim 47 ~~[[50]]~~, wherein the means for selecting, determining and allocating operate in connection with the first service group, the second service group and a third service group.

65. (Currently Amended) A radio communication system for allocating radio resources for a first and second service group comprising:

means for determining an amount of radio resources at which the first service group can provide an minimum quality of service level;

means for determining an amount of radio resources allocated for the second service group; and

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means for reallocating radio resources proportionally from the second service group to the first service group such that the service quality limits are simultaneously met;

means for determining an amount of radio resources at which a third service group can provide an minimum quality of service level;

means for determining an amount of radio resources allocated for a third service group; and

means for reallocating radio resources from the fourth service group to the third service group such that the total load between the first, second, third and fourth service groups is maximized.

66. (Original) The system of claim 65, wherein the radio resources are reallocated to maximize capacity.

67. (Cancelled)

68. (Original) The system of claim 65, wherein the radio resources are an output power for the first and second service groups.

69. (Original) The system of claim 68, wherein the radio resources are further a channel allocation for the first and second service groups.

70. (Original) The system of claim 68, wherein the output power for the first and second service groups is a per bearer output power for the first and second service groups.

71. (Original) The system of claim 68, wherein the output power is an initial power for the service group.

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72. (Original) The system of claim 68, wherein the output power is a maximum power for the service group.

73. (Original) The system of claim 68, wherein the output power is a fixed power for the service group.

74-81. (Cancelled)

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